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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/811,274

03/26/2004

Masami Ueda

F-8197

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12/12/2006

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EXAMINER

MORILLO, JANEL COMBS

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/811,274

Applicant(s)

UEDA ET AL.

Examiner

Janelle Combs-Morillo

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1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09/700566.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 49-009465A (JP'465) in view of "Metals Handbook: Vol. 1" p 793-800.

JP'465 teaches a maraging steel with a composition comprising (in weight%): 18-24% Ni, 0-13% Co, 0-6% Mo, 0-3% Ti, 0-1% Al, <0.3% total impurities including <0.04% O, balance Fe (see abstract, etc.), which broadly overlaps the instant alloy composition. JP'465 teaches that a process of forging, heating to 1100-1200°F for 10 hr, quenching, machining, aging, and finish forming said alloy is able to control the inclusion defects to  $\leq 2 \mu\text{m}$  (abstract). Concerning the maraging steel property of "excellent in fatigue characteristics", because the prior art teaches a maraging steel within the instant ranges processed substantially as presently claimed (see further discussion below), then substantially the same fatigue characteristics are expected to result.

JP'465 does not mention a) casting, b) segregation ratios of Ti or Mo, c) forging at a ratio of at least 4.

Concerning items a), b), "Metals Handbook Vol 1" teaches that while casting maraging steels, it is important to limit microsegregation during solidification by homogenizing during hot working, as well as to adjust the ingot size to ensure elimination of segregation. For instance;

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for 18Ni(350) with a composition of 18% Ni, 4.2-4.8% Mo, 12.5% Co, 1.4-1.6% Ti, 0.1% Al, ≤ 0.03% C (Table 1, p 793), the ingot size is smaller than normal in order to ensure good structure (p 795, 2<sup>nd</sup> column).

"[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), Peterson, 315 F.3d at 1330, 65 USPQ2d at 1382 ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages"). A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Ingot size/shape is taught to be a result effective variable (see "Metals Handbook Vol 1", p 795, 2<sup>nd</sup> column), wherein the expected result is a lower degree of segregation for a smaller ingot size (wherein smaller ingots have faster solidification rates).

Concerning item c), "Metals Handbook Vol 1" teaches maraging steels are hot worked by conventional steel mill techniques (p 795, 2<sup>nd</sup> column) to produce a variety of useful product forms, including plate, sheet, bar stock (p795, 1<sup>st</sup> column). Table 3 of "Metals Handbook Vol 1" gives examples of 8in thick ingots, but does not teach the final product (plate, sheet, bar) thickness (said Table gives semifinished billet thickness). However, the thickness defined by a "sheet" or "plate" is held to be << than the 2.5in billet or the 8in ingot taught by "Metals

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Handbook Vol 1". Therefore, the reduction ratio of the instant claims is held to be within the scope taught by "Metals Handbook Vol 1".

It would have been obvious to one of ordinary skill in the art to perform the process of forming a maraging steel taught by JP'465, while optimizing the casting ingot size/solidification profile taught by "Metals Handbook Vol 1", because "Metals Handbook Vol 1" teaches that it is important to limit microsegregation during solidification by adjusting the ingot size to ensure elimination of segregation (p 795, 2<sup>nd</sup> column).

Concerning independent claims 2 and 3, as stated above, JP'465 teaches the nonmetallic inclusion is within the claimed maximum. Concerning the ingot taper apparatus parameters used to perform the instant process of casting, as stated above, the ingot size/shape is held to be a result effective variable, wherein the expected result is a lower degree of segregation for a smaller ingot size/ faster solidification rates. With respect to the teachings taught by the prior art of record, applicant has not clearly shown specific unexpected results with respect to the prior art of record or criticality of the instant claimed range (wherein said results must be fully commensurate in scope with the instantly claimed ranges, etc. see MPEP 716.02 d).


### ***Conclusion***

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
ROY KING  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1742

  
JCM

December 4, 2006